THERE WILL BE NO CHANGES IN SPECIFICATION, DIMENSIONS, OR MATERIALS UNLESS APPROVED BY THE ENGINEER RESPONSIBLE FOR THIS DRAWING.

THE DRAWINGS ARE PREPARED COOPERATIVELY BY THE NATURAL RESOURCE CONSERVATION SERVICE FOR THE NAMED LANDOWNER. CONSTRUCTION FOUND NOT IN ACCORDANCE WITH THESE DRAWINGS AND SPECIFICATIONS SHALL VIOLATE THE COOPERATIVE AGREEMENT AND ALL DRAWINGS, SPECIFICATIONS, AND QUANTITIES ESTIMATE SHALL IMMEDIATELY BE RETURNED TO THE LOCAL NRCS OFFICE.

LANDOWNER/PROJECT

378 - POND

468 - LINED WATERWAY OR OUTLET

(DISTRICT SOIL CONSERVATION DISTRICT)

AS-BUILT STATEMENT

THE CONSERVATION PRACTICE(S) MEETS OR EXCEEDS NRCS STANDARDS AND SPECIFICATIONS

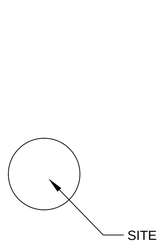
INSPECTED BY _____ SIGNATURE _____ DATE

CONSTRUCTION APPROVAL _____ SIGNATURE _____ DATE

VERIFIED DISTRICT CONSERVATIONIST _____ SIGNATURE _____ DATE

SAFETY REGULATIONS

ALL EXCAVATION AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MARYLAND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (MOSHA) STANDARDS AS SET FORTH IN THE LATEST VERSION OF THE CODE OF MARYLAND REGULATIONS



OWNER/CONTRACTOR STATEMENT

I CERTIFY THAT THIS DESIGN HAS BEEN EXPLAINED TO ME BY A REPRESENTATIVE OF THE _____DISTRICT_____ SOIL CONSERVATION DISTRICT, AND I UNDERSTAND THE CONTENTS, ALL CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS AND SPECIFICATIONS, I FURTHER UNDERSTAND THAT ALL CONSTRUCTION WILL BE UNDER THE INSPECTION OF THIS OFFICE.

_____
OWNER'S SIGNATURE DATE

_____
CONTRACTOR'S SIGNATURE DATE

CONSTRUCTION NOTIFICATION

The Contractor/Owner is to notify the __DISTRICT_____SOIL CONSERVATION DISTRICT at least 72 hours prior to construction to facilitate any scheduling, layout, or preliminary mobilization necessary to ensure proper construction inspection to enable appropriate certification of the project.

It is the Landowner's responsibility to obtain all County, State, and Federal permits that may be needed, and to maintain this structure and related regulations.

VICINITY MAP
N.T.S.

811®
Know what's below.
Call before you dig.

"The Soil Conservation District makes no representation as to the existence or Non-existence of any utilities at the construction site. Shown on these construction drawings are those utilities which have been identified. It is the responsibility of the landowners or operators and contractors to assure themselves that no hazard exists or damage will occur to utilities"

MATERIALS LIST

SITE DATA:

LANDOWNER INFORMATION:

STREAM CLASSIFICATION:

CONTACT PERSON:

SITE DETAILS:
TOTAL DISTURBED ACRES = ±
TOTAL DISTURBED SQFT = ±

GENERAL NOTES:

- PLEASE CONTACT THE DISTRICT SOIL CONSERVATION DISTRICT AT LEAST 3 DAYS PRIOR TO CONSTRUCTION TO ARRANGE A PRE-CONSTRUCTION MEETING @ PHONE #
- EXISTING GULLY MUST BE FILLED AND TAMPED IN 4-6" LIFTS
- A CONSERVATION TECHNICIAN SHALL VERIFY CUT/GRADE STAKES AT THE CONTRACTORS REQUEST
- A CONSERVATION TECHNICIAN MUST BE PRESENT AT THE TIME OF PIPE INSTALLATION

Designed MM/YY
Drawn
Checked

LANDOWNER
378 POND
TRACT
City, Maryland

Approved Date
Title Job Class

Maryland Department of Agriculture
DISTRICT Soil Conservation District

United States Department of Agriculture
Natural Resources Conservation Service

REVISIONS

Date	Description	Approved

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Sheet 1 of 5

LEGEND

- EL — EXISTING TOPO (1FT INTERVALS)
- EXISTING WOODS
- EXISTING FENCE
- EL — PROPOSED TOPO
- PROPOSED ROCK OUTLET
- PROPOSED POOL AREA
- PERMANENT POOL AREA
- PROPOSED BUFFER
- LOD — PROPOSED LIMITS OF DISTURBANCE
- SF — PROPOSED SILT FENCE
- SOIL BORING

PLAN VIEW

LANDOWNER
378 POND
TRACT
City, Maryland

Designed MM/YY
Drawn
Checked

Approved _____ Date ____
Title _____ Job Class ___

Maryland Department of Agriculture
DISTRICT Soil Conservation District

United States Department of Agriculture
USDA
Natural Resources Conservation Service

REVISIONS

Date	Description	Approved

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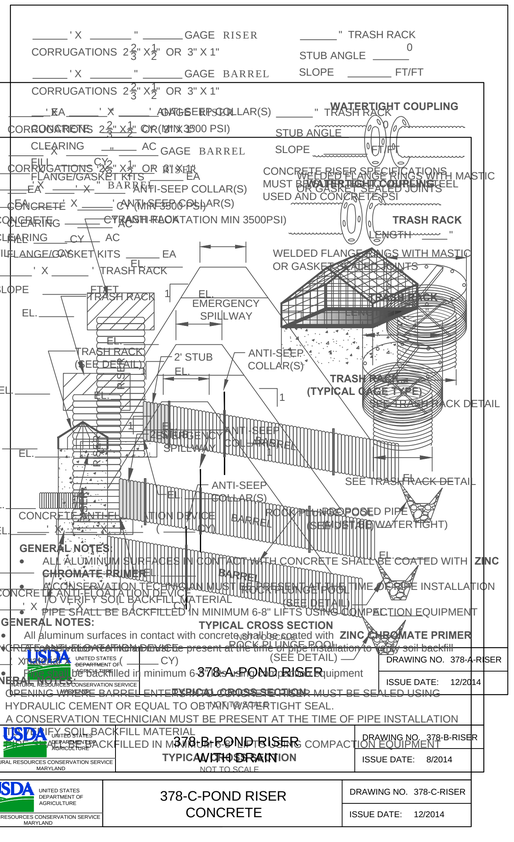
*.DWG



USDA UNITED STATES DEPARTMENT OF AGRICULTURE — NATURAL RESOURCES CONSERVATION SERVICE MARYLAND	378-A-POND RISER
	DRAWING NO. 378-A-RISER
	ISSUE DATE: 12/2014

USDA UNITED STATES DEPARTMENT OF AGRICULTURE — NATURAL RESOURCES CONSERVATION SERVICE MARYLAND	378-B-POND RISER
	DRAWING NO. 378-B-RISER
	ISSUE DATE: 8/2014

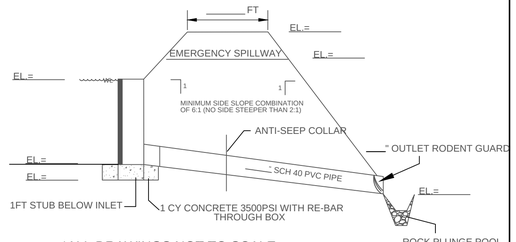
USDA UNITED STATES DEPARTMENT OF AGRICULTURE — NATURAL RESOURCES CONSERVATION SERVICE MARYLAND	378-C-POND RISER CONCRETE
	DRAWING NO. 378-C-RISER
	ISSUE DATE: 12/2014

PROFILES/CROSS SECTIONS

PIPE SIZE _____"
STRUCTURE HEIGHT _____'(INCLUDES 1FT STUB)
_____' OF _____ " SCH 40 PVC PIPE INLET PIPE
_____' X _____' ANTI-SEEP COLLAR
CLEARING _____ AC
CONCRETE _____ CY (MIN 3500 PSI)
FILL _____ CY
SLOPE _____ FT/FT

TYPICAL DRAIN STRUCTURE

CROSS SECTION

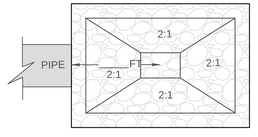


*ALL DRAWINGS NOT TO SCALE

NRCS Natural Resources Conservation Service United States Department of Agriculture	INLET WATER CONTROL STRUCTURE	Designed / Drawn / Checked / Approved	Date / File No. / Drawing No. / Sheet of

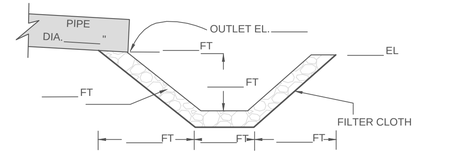
RIPRAP_____ TONS
GRADATION ____" TO ____" D50 =_____"
FILTER CLOTH _____ SQFT
(CLASS "SE" SEE TABLE)
THICKNESS OF RIPRAP _____ FT
DISTANCE TO CL OF PLUNGE FROM PIPE OUTLET _____ FT
DEPTH OF BASIN @ CL OF PLUNGE _____FT
CLEARING _____ AC

PLAN VIEW



OUTSIDE DIMENSIONS
_____FT (L) X _____ FT (W)
INSIDE DIMENSIONS
_____FT (L) X _____ FT (W)

CROSS SECTION



NRCS Natural Resources Conservation Service United States Department of Agriculture	PLUNGE POOL	Designed / Drawn / Checked / Approved	Date / File No. / Drawing No. / Sheet of

STATE HIGHWAY ADMINISTRATION GEOTEXTILE REQUIREMENTS

Maryland Application Class	Type of Geotextile	Grab Strength Lb D 4632	Puncture Strength Lb D 4833	Permittivity Sec`1	Apparent Opening Size, Max Mm D 4751	Trapezoid Tear Strength Lb D4533
SD	NONWOVEN	160	56	0.50	0.43	55
TYPE I	WOVEN, MONOFILAMENT	260	90	0.50	0.43	90
SD	NONWOVEN	160	56	0.20	0.26	55
TYPE II	WOVEN, MONOFILAMENT	260	90	0.20	0.26	90
PE	NONWOVEN	200	80	0.70	0.43	80
TYPE I	WOVEN, MONOFILAMENT	250	90	0.70	0.43	90
PE	NONWOVEN	200	80	0.20	0.26	80
TYPE I	WOVEN, MONOFILAMENT	250	90	0.20	0.26	90
PE	NONWOVEN	200	80	0.10	0.22	80
TYPE III	WOVEN	250	90	0.10	0.22	90
SE	NONWOVEN	200	80	0.20	0.30	80
	WOVEN	250	90	0.20	0.30	90
ST	WOVEN	300*	110	0.05	0.15**	110
F	WOVEN	100	-	0.05	0.60	-
E	NONWOVEN	90	30	0.05	0.30	30

Note: 1 All property values are based on minimum average roll values in the weakest principle direction, except for apparent opening size.
Note: 2 The ultraviolet stability shall be 50 percent after 500 hours of exposure for all classed, except Class F, which shall be 70 percent (D 4355)
* Minimum 15 percent elongation.
** This is a minimum apparent opening size, not a maximum.

Designed MM/YY
Drawn
Checked

LANDOWNER
378 POND
City, Maryland
TRACT

Approved _____ Date _____
Title _____ Job Class _____

Maryland Department of Agriculture
DISTRICT Soil Conservation District

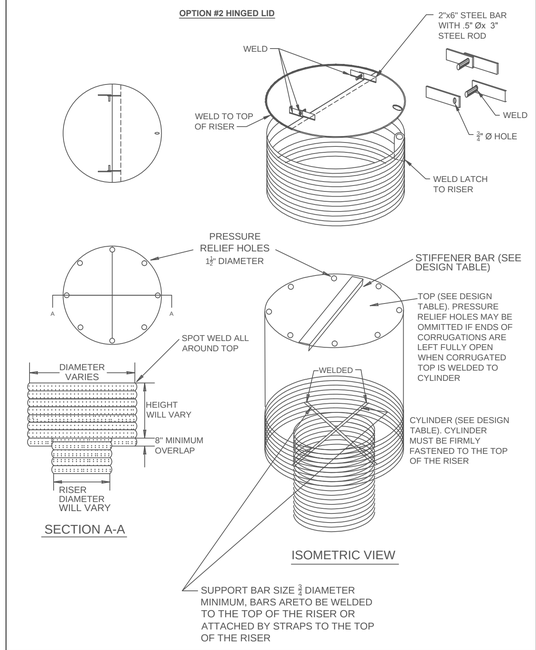
United States Department of Agriculture
USDA
Natural Resources Conservation Service

REVISIONS

Date	Description	Approved

File No.
*.DWG

DETAIL 16 - CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE



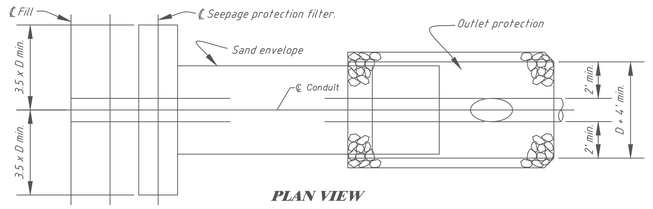
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 10 - 26	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 16 CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (continued)

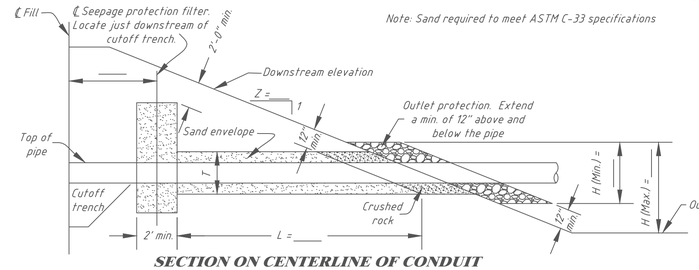
Riser Diam.,	Trash Rack Cylinder Diam., in.	Thick., gage	H, in.	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	# 6 Rebar	16 ga.	--
15	21	16	7	"	"	--
18	27	16	8	"	"	--
21	30	16	11	"	"	--
24	36	16	13	"	14 ga.	--
27	42	16	15	"	14 ga.	--
36	54	14	17	# 8 Rebar	12 ga.	--
42	60	14	19	"	"	--
48	72	12	21	1-1/4" pipe or 1-1/4 x 1-1/4 x 1/4 angle	10 ga.	--
54	78	12	25	"	"	--
60	90	12	29	1-1/2" pipe or 1-1/2 x 1-1/2 x 1/4	8 ga.	--
66	96	10	33	2" pipe or 2 x 2 x 3/16 angle	8 ga. w/ stiffener	2 x 2 x 1/4 angle
72	102	10	36	"	"	2-1/2 x 2 - 1/2 x 1/4 angle
78	114	10	39	2-1/2" pipe or 2x2x1/4 angle	"	"
84	120	10	42	2-1/2" pipe or 2-1/2 x 2-1/2 x 1/4 angle	"	2-1/2 x 2-1/2 x 5/16 angle

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must meet the requirements of MD 378.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 10 - 26A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

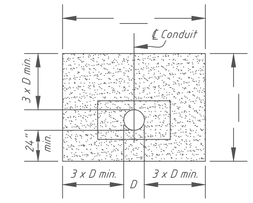


PLAN VIEW

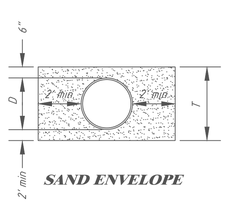


SECTION ON CENTERLINE OF CONDUIT

Note: Sand required to meet ASTM C-33 specifications



SECTION ON CENTERLINE OF SEEPAGE PROTECTION FILTER



SAND ENVELOPE

Construction Notes:

1. Natural ground or earth fill shall be completed to above the top of the sand envelope and a trench excavated (per detail) for the pipe and sand envelope placement.
2. The sand envelope will be protected from surface erosion by 12 inches of crushed rock aggregate (max. size = 1 inch) covered with 12 inches of outlet protection material. This material may be rock riprap, broken concrete debris, or native stone (max. size = 8 inches).
3. Seepage protection filter and envelope material shall be compacted as specified in the construction specification.
   - A. Each layer of sand material shall be flooded prior to compaction.
   - B. Compaction shall be accomplished while the material is wet.
   - C. Each layer shall be compacted by a minimum of 2 passes of a hand-directed, vibratory compactor over the entire layer surface.
   - D. Layer thickness shall not exceed 12 inches after compaction.

Multiplier for Crushed Rock & Protection Material

Fill Slope Z	Multiplier "M" $(Z^2+1)^{0.5}$
2.5	2.69
3.0	3.16
4.0	4.12

Filter Quantities

Pipe Diameter "D" (Inches)	Min. Drain Fill - Cu. Ft.	
	Seepage Protection Filter	Envelope Per Lin. Ft. of "L" "E"
6	25	6.6
8	40	7.5
10	56	8.3
12	77	9.2
15	114	10.7
18	158	12.0
24	266	14.9
30	403	17.8
36	567	20.9
42	760	24.1
48	980	27.4

ASTM C-33 Fine Aggregate Gradation for Filter and Envelope

Sieve Size	Percent Passing
3/8	100
4	95-100
10	74-94
20	35-75
30	25-60
50	10-30
100	2-10

Quantity Requirements

Protection Filter = $\dfrac{(E)\left[L-\dfrac{(Z)(T)}{2}\right]}{27}$ = _____ Cu. Yds.

Sand Envelope = $(E)(L)/27$ = _____ Cu. Yds.

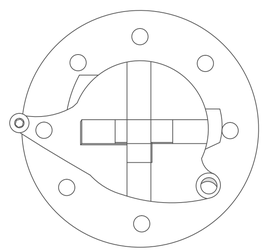
Crushed Rock = $(E)(M)/27$ = _____ Cu. Yds.

Cu. Yds. x 1.35 = _____ Tons

Outlet Protection = $\dfrac{\left[(D+4)(H)(M)\right]-\left[\dfrac{\pi(D)^2}{4}(M)\right]}{27}$ = _____ Cu. Yds.

Cu. Yds. x 1.35 = _____ Tons

SAND DIAPHRAGM



AS PER SOUTHEASTERN PIPE & DRAIN SYSTEMS

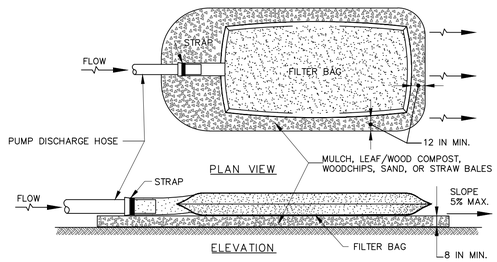
PIPE SIZE _____"

NOT TO SCALE

NRCS Natural Resources Conservation Service, United States Department of Agriculture	SHEAR GATE DETAIL	Designed / Drawn / Checked / Approved — Date	File No. / Drawing No. / Sheet of

DETAIL F-4 FILTER BAG

STANDARD SYMBOL: ⊠FB



CONSTRUCTION SPECIFICATIONS

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

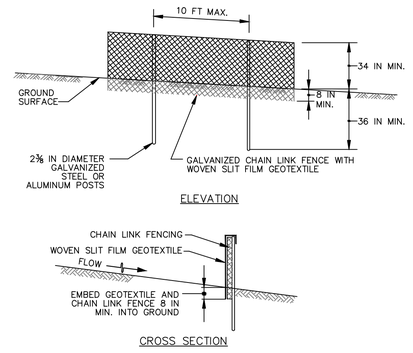
GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC^{-1})	1.2 SEC^{-1}	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15–0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: —SSF—



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

OPERATION AND MAINTENANCE SCHEDULE FOR SEDIMENT CONTROL POND

15 year maintenance life

1. Removal of any blockage of trash and debris that could affect flows through the structure.
2. Mow, fertilize and lime to maintain flow capacity, grass height of 6-8 inches, plant density and to promote vigorous growth.
3. Inspect at least once a year and after major storms for areas that are eroding and need reseeding. Repair problems immediately. Fill in and reseed, following original seeding specifications.
4. Maintain the width of grassed area when tilling and planting adjacent to structure.
5. Check material used in the structure for deterioration or failure. Includes rock used for outlet protection.
6. Repairs should be made as soon as possible. Repairs should be made to return the structure to the same condition as it was designed.
7. Inspect pipe structures annually, secure anti-vortex devices, trash racks and/or rodent guards in place and make sure they are functioning properly.
8. If pond needs to have repairs, please contact the Soil Conservation District to inspect the type of repairs that need to be completed.
9. Inspect the dam annually for woody vegetation growth. Remove any woody vegetation that is present on the dam.
10. Complete the attached Dam Inspection Checklist, APPENDIX A, annually. Report to the Soil Conservation District of any problems with the structure noted on the checklist.

Designed MM/YY
Drawn
Checked

LANDOWNER
378 POND
TRACT
City, Maryland

Approved — Date
Title — Job Class

Maryland Department of Agriculture
DISTRICT Soil Conservation District

USDA United States Department of Agriculture
Natural Resources Conservation Service

REVISIONS

Date	Description	Approved

File No. *.DWG

Sheet 4 of 5

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Earth Fill

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ±2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structural backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.
   Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.
   Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

   All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, prepunched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12- inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable. Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "**Structure Backfill**".

6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding / cradle for their entire length. This bedding / cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D- 1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" – 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding -The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to "**Structure Backfill**".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

Pipeline 516-4

SPECIFICATIONS

Plans and specifications for installing pipelines shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the pipeline is a component of a system that includes additional conservation practices, the information necessary to construct these additional practices will also be conveyed on the plans.

Placement

Install pipelines so that they are protected against hazards imposed by traffic, farm operations, freezing temperatures, or soil cracking. Other means of protection must be provided if the depth required for protection is impracticable because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent rupture of the pipe.

Trenches for plastic pipelines shall be free of rocks and other sharp-edged materials. Carefully place the pipe to prevent damage. Initial backfill shall be of selected material that is free of rocks or other sharp-edged material that can damage the pipe. Deformation or displacement of the pipe must not occur during backfilling.

Plastic pipelines may be placed by plow-in equipment if soils are suitable and rocks and boulders will not damage the pipe. Plastic pipelines installed by the plow-in method require surface compaction and shaping in addition to the normal plow-in operations.

Testing

Test the pipeline for leaks by filling the pipe with water at the design working head or by testing at the working pressure. Repair leaks as needed.

OPERATION AND MAINTENANCE

Provide to the landowner an O & M plan specific to the type of installed pipeline. The plan shall include, but not be limited to, the following provisions:

1. Inspect collection and storage devices, valves, outlets and pipelines at least twice per year. Make repairs as needed;
2. Check for debris, algae, sludge or other materials in the system, which may restrict the inflow or outflow system, and remove;
3. Prepare guidance for winter weather operation, such as cleaning and discontinuing use, or providing for frost-free use;
4. Protect from damage due to livestock and farm equipment. Maintain fences and other devices used for this purpose;
5. Check for leaks and repair immediately;
6. Check valves, automatic water level devices, and overflow pipes for proper operation;
7. Chemical may be added to the system for algae and other water quality issues when in accordance with local rules and regulations;
8. Maintain vegetative cover around the system. Mow at least yearly. Provide weed control as needed. Reseed, lime, and fertilize area as needed.

LANDOWNER TRACT			PRACTICE(S)			
TOTAL AREA	**AREA 1**		**AREA 2**		**AREA 3**	
MATERIALS/RATE	**AMOUNT PLANNED**	**AMOUNT APPLIED**	**AMOUNT PLANNED**	**AMOUNT APPLIED**	**AMOUNT PLANNED**	**AMOUNT APPLIED**
FERTILIZER ***10-20-20*** **500LBS/AC**						
LIME- **2TONS/AC** *DOLOMITIC*						
SEED MIXTURE (SEE BELOW)						
MULCH **2 TONS/AC**						

ENTER KINDS AND AMOUNT OF SEED BELOW **NOTE: INOCULATE ALL LEGUMES**

AREA 1 NRCS SEED MIX #	**AREA 2 NRCS SEED MIX #**	**AREA 3 NRCS SEED MIX #**

SITE PREPARATION AND OTHER PERTINENT INFORMATION:
DISK ALL DISTURBED AREAS TO A DEPTH OF 4-6"
CULTIPACK AFTER SEEDING

SEEDING DATES
SPRING:
FALL:

PLAN APPROVED BY:		CHECKED FOR TECHNICAL COMPLANCE BY:	
TITLE	DATE	TITLE	DATE

USDA UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE MARYLAND

SEEDING

DRAWING NO. S-1.0
ISSUE DATE: 7/2014

Designed MM/YY
Drawn
Checked

LANDOWNER
378 POND
TRACT
City, Maryland

Approved
Title
Date
Job Class

Maryland Department of Agriculture
DISTRICT Soil Conservation District

United States Department of Agriculture
USDA
Natural Resources Conservation Service

REVISIONS
Date | Description | Approved

File No.
*.DWG

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